

PORTABLE ELECTRONIC APPARATUS

TECHNICAL FIELD

[0001] The present invention relates to a portable electronic apparatus such as a cellular telephone.

BACKGROUND ART

[0002] Conventionally, in a cellular telephone as a portable electronic apparatus, a biaxial hinge mechanism is used as a hinge portion in order to connect a plurality of bodies composed of a second body and a first body to be openable/closable and rotatable. The biaxial hinge mechanism includes a first axial hinge for opening and closing and a second axial hinge for rotating, in which the second body is fixed to the first axial hinge and the first body is fixed to the second axial hinge. Such a conventional structure is disclosed in the following Patent Documents.

[0003] Patent Documents 1 to 3 disclose a threaded fixing mechanism in a direction orthogonal to a rotational axis of the second axial hinge. Patent Document 4 discloses a threaded fixing mechanism in a direction parallel to the rotational axis of the second axial hinge.

[0004] In addition, conventionally, a cellular telephone and the like having a body formed mainly of resin are becoming smaller in thickness, and therefore it is required to maintain the strength of the body. Given this, in order to maintain the strength of the body, a metal frame formed of a metal plate or by die casting is disposed in the body formed of resin. Patent Documents 5 and 6 disclose disposing a structure obtained by resin insert molding of a metal plate and a metal frame inside a body formed of resin, for a further reduction in thickness of the body.

[0005] Patent Document 1: Japanese Unexamined Patent Application, Publication No. 2004-218688

[0006] Patent Document 2: Japanese Unexamined Patent Application, Publication No. 2005-311004

[0007] Patent Document 3: Japanese Unexamined Patent Application, Publication No. 2006-10025

[0008] Patent Document 4: Japanese Unexamined Patent Application, Publication No. 2003-174495

[0009] Patent Publication 5: Japanese Unexamined Patent Application, Publication No. 2004-228238

[0010] Patent Publication 6: Japanese Unexamined Patent Application, Publication No. 2007-53450

DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

[0011] However, in the technique disclosed in Patent Documents 1 to 4, one of the axial hinges (the second axial hinge) in the biaxial hinge mechanism that connects two bodies is fixed by threads in a thickness direction of a set of the second body and the first body (in an overlapping direction of the bodies). Therefore, a thickness in the thickness direction of the set of the bodies increases, thereby preventing a reduction in thickness of the electronic apparatus.

[0012] In addition, the biaxial hinge mechanism is formed by modularizing by way of die-casting with magnesium or the like; however, there is a limitation in reducing the thickness of the body from a viewpoint of securing the strength of the biaxial hinge mechanism. Therefore, there is a problem in that a restriction is imposed on reductions in thickness and size of

the electronic apparatus. The same applies to a hinge mechanism other than the biaxial hinge mechanism (for example, a uniaxial hinge mechanism).

[0013] In addition, in such a portable electronic apparatus, as disclosed in Patent Documents 5 and 6, the metal frame for securing the strength of the body needs to be fixed by threads to other component inside the body. Firmer and more reliable threaded fixing is required for fixing the metal frame.

[0014] The present invention is made in view of the above-mentioned problems and aims at providing a portable electronic apparatus that allows for a reduction in thickness in a thickness direction and a size of a set of the bodies, while securing sufficient strength of the bodies.

Means for Solving the Problems

[0015] The present invention relates to a portable electronic apparatus including: a first body that is substantially flat plate shaped; a second body; and a hinge portion that has a fixing portion that is fixed inside the first body and that connects the first body with the second body, in which the first body includes a metal plate member having a bent portion on an end side thereof that is bent in a thickness direction of the first body, and in which the bent portion of the metal plate member has a threaded hole and is tightened together with the fixing portion by way of a screw that is inserted into the threaded hole in a direction orthogonal to a thickness direction of the first body.

[0016] In addition, it is preferable that the hinge portion includes a first rotational axis that allows the first body to transition between an opened state and a closed state with respect to the second body, and a second rotational axis that allows the first body to rotate with respect to the second body by way of an axis orthogonal to the first rotational axis; the hinge portion is fixed to the second body so as to be rotatable about the first rotational axis; and the fixing portion is rotatable about the second rotational axis with respect to the hinge portion.

[0017] In addition, it is preferable that the first body is configured to include a body piece obtained by resin insert molding of the metal plate member, and the bent portion of the metal plate member is tightened together with the fixing portion by way of the screw via a resin layer formed by the resin insert molding.

[0018] In addition, it is preferable that the first body includes a display, and the metal plate member is a member that holds a back face side of the display.

[0019] In addition, it is preferable that the first body includes a sub-display; the metal plate member is provided with a standing tooth portion that is formed by cutting out and bending a portion of the metal plate member toward the back face side of the display; and the sub-display is positioned by the standing tooth portion.

[0020] In addition, it is preferable that the resin layer formed on the bent portion includes a screw stopping surface on a first face thereof that a head of the screw abuts; and a sloped surface having a predetermined slope with respect to the screw stopping surface and a projecting surface that has a face parallel to the screw stopping surface and projects more than the slope surface are formed on a face thereof that is opposite to the first face.

[0021] In addition, it is preferable that an area of the sloped surface is greater than that of the projecting surface.